

Assembled 3D Joint

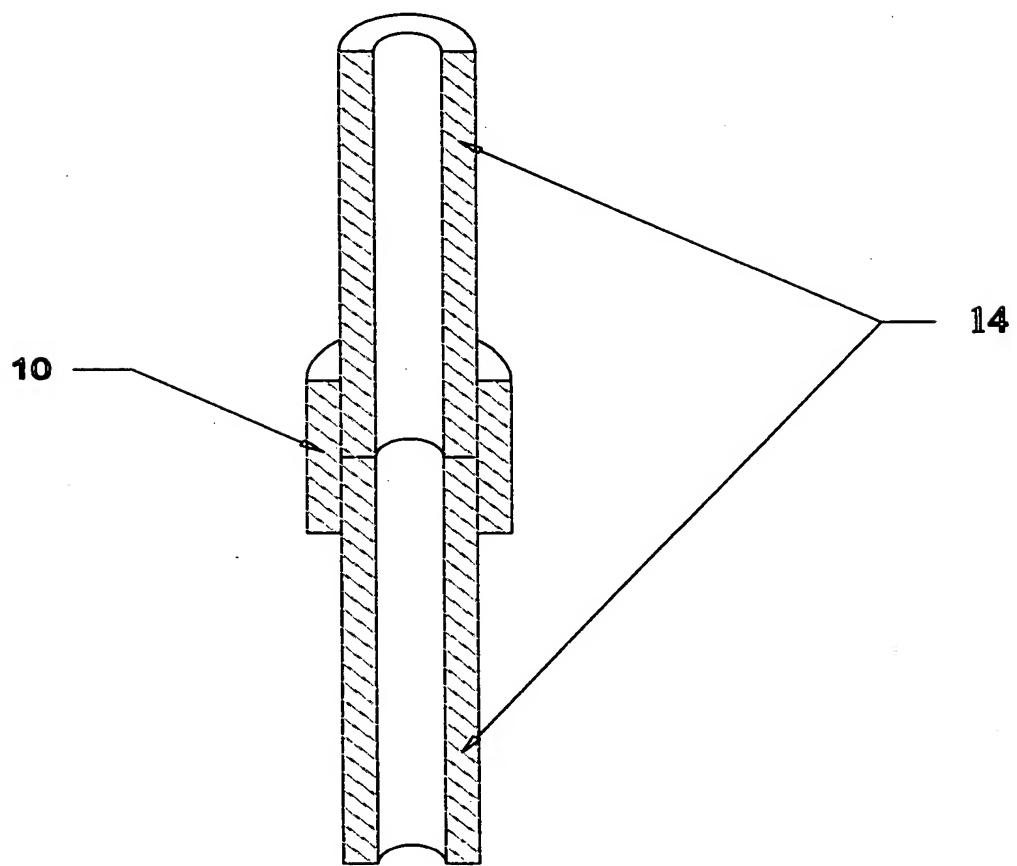


FIG. 1

Tapered 3D Joint

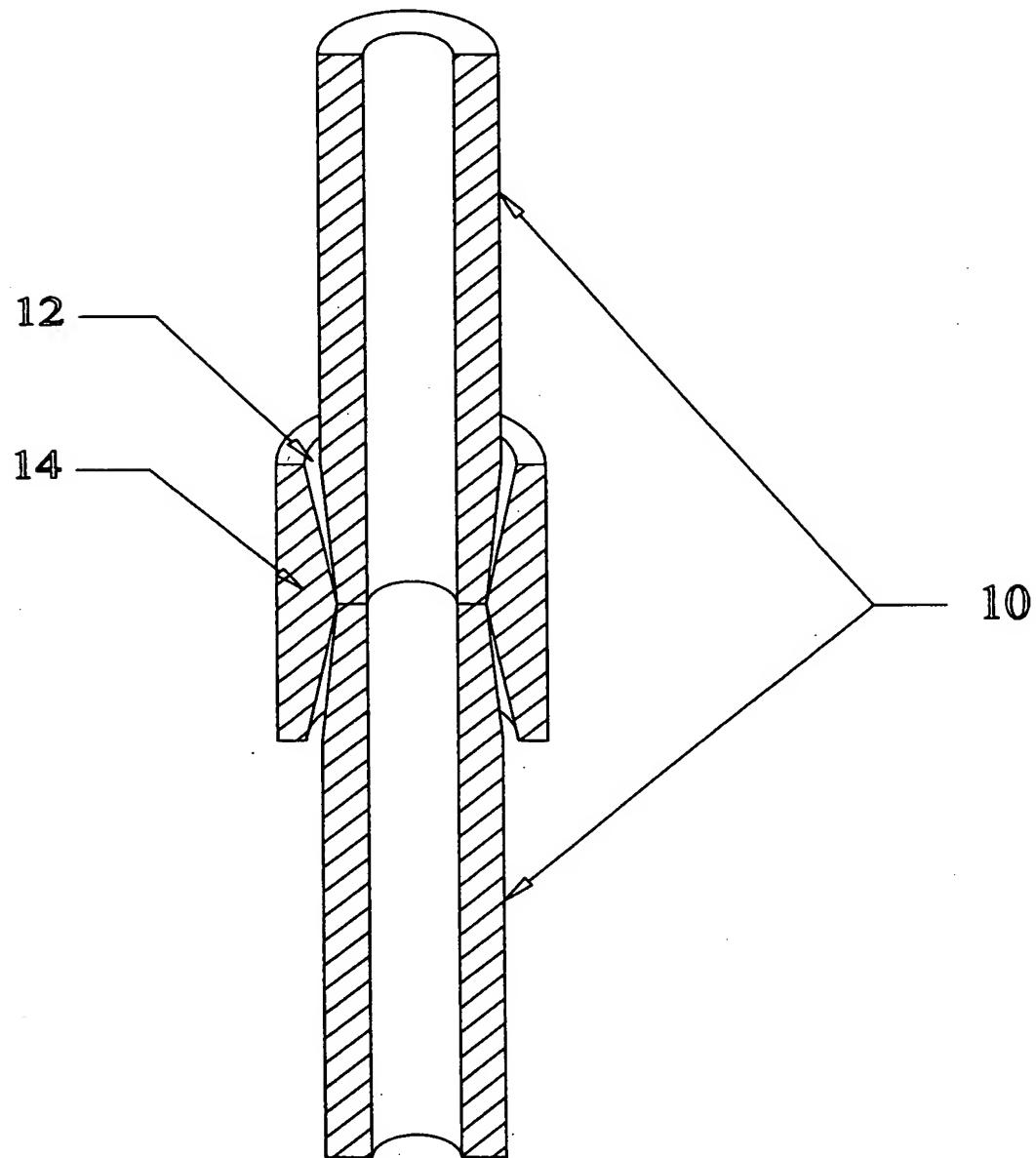


FIG. 2

**Large diameter
to small diameter
lap joint**

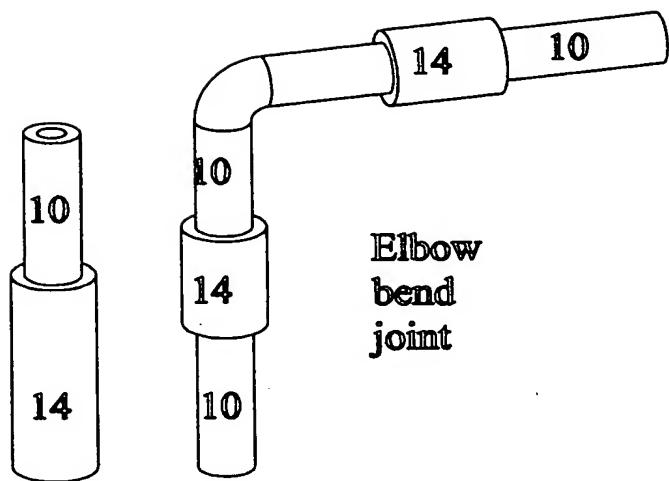


FIG. 3a

**Elbow
bend
joint**

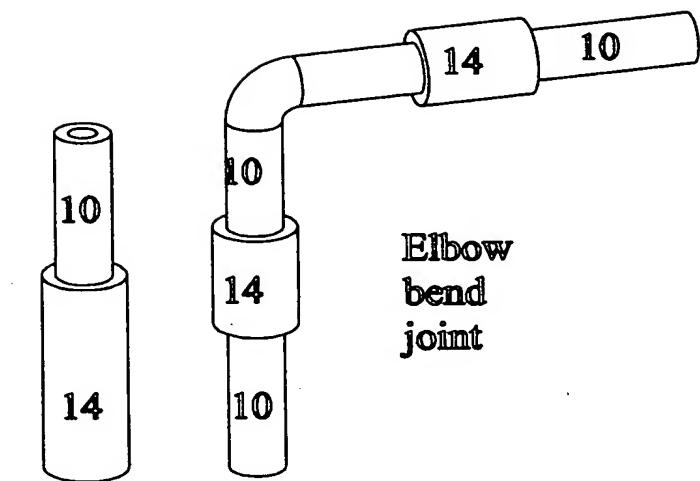


FIG. 3b

**U-bend
joint**

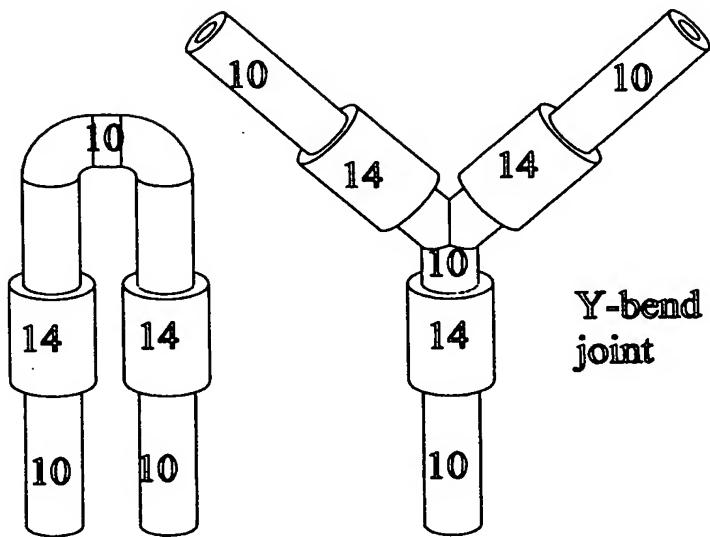


FIG. 3c

**Y-bend
joint**

FIG. 3d

**Manifold
Configuration**

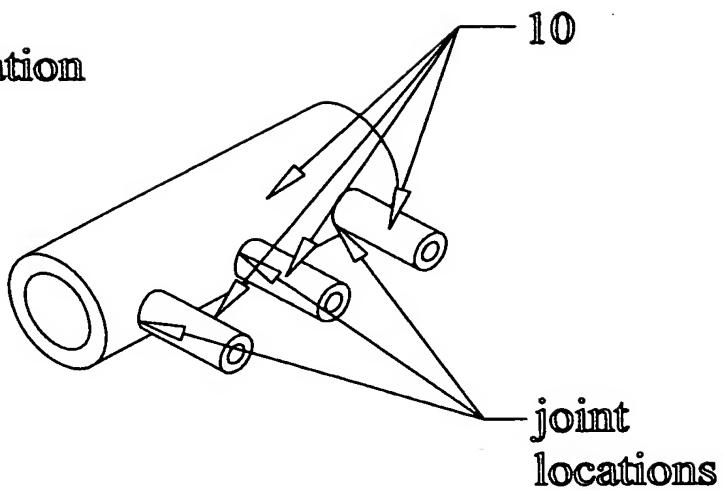


FIG. 4a

**Corner
Edge
Joint**

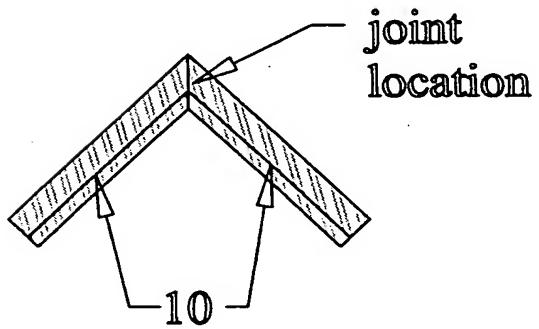


FIG. 4b

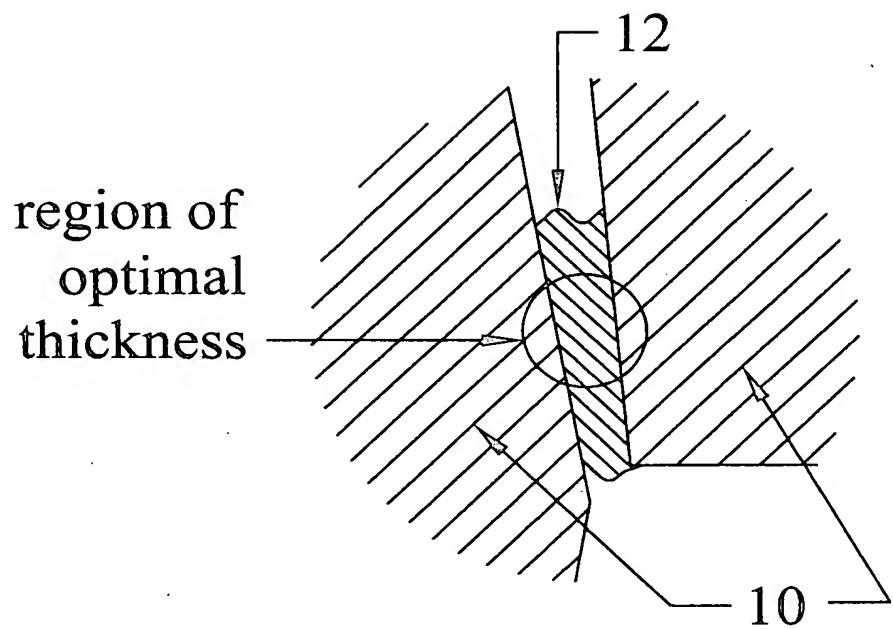


FIG. 5

3D Joint Fabrication Process

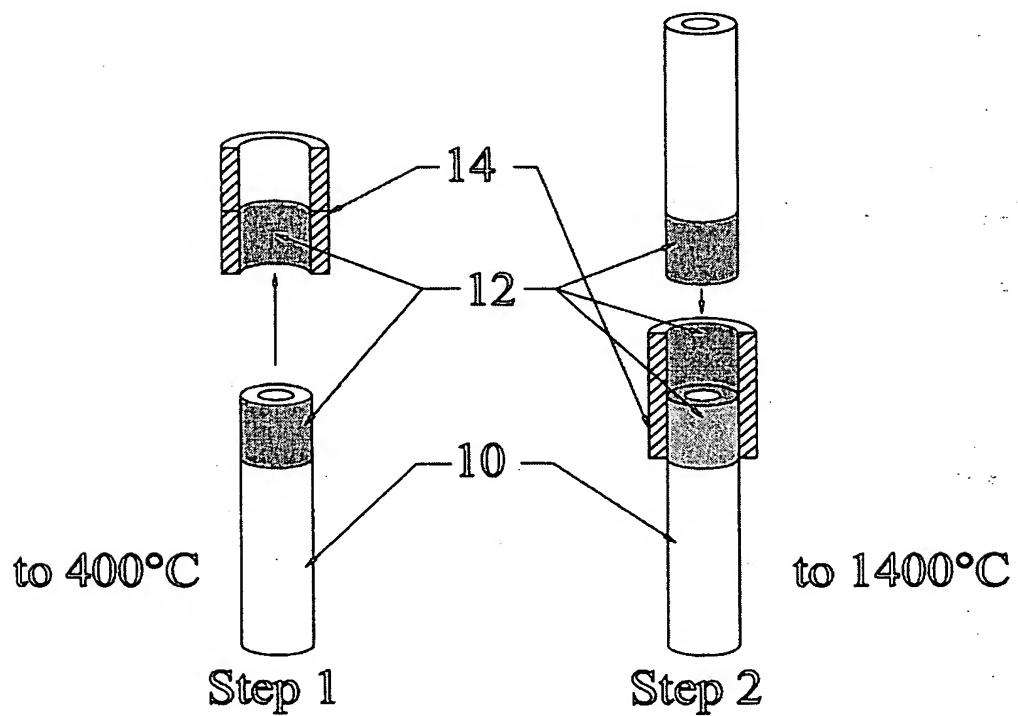


FIG. 6